



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/874,670	06/05/2001	Shunpei Yamazaki	SEL-156 DIV	6756

7590

02/13/2003

Edward D. Manzo
Cook, Alex, McFarron, Manzo,
Cummings & Mehler, Ltd.
200 West Adams St., Ste. 2850
Chicago, IL 60606

EXAMINER

MALSAWMA, LALRINFAMKIM HMAR

ART UNIT

PAPER NUMBER

2825

DATE MAILED: 02/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/874,670

Applicant(s)

YAMAZAKI ET AL.

Examiner

Lex Malsawma

Art Unit

2825

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on June 5, 2001 through January 8, 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 18-59 (as renumbered) is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 18-59 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09/477,865.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2,6,7.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

On page 4 (in the last two lines), "group 15" should be changed to "group V" (or to "group 5"); and "group 13" should be changed to "group III" (or to "group 3").

Note that the term(s) "group 15" and/or "group 13" also appear(s) on at least pages 6-10, 23, 25, 49, 50, and 56. Appropriate correction is required.

2. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

3. The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

Misnumbered Claims 27-68 (new) have been renumbered as Claims 18-59, i.e., only Claims 1-17 existed in the application as originally filed.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 22, 28, 34, 40, 42, 44, 46, 48, 50, 52, and 58 (*formerly, Claims 31, 37, 43, 49, 51, 53, 55, 57, 59, 61, and 67, respectively*) are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 22 and 28 (*formerly Claims 31 and 37*) recite the limitation “said third insulating film” in the last line of each claim. There is insufficient antecedent basis for this limitation in the claim. Examiner interprets the limitation as “said first insulating film”. Claims 34, 42, 46, 50, and 58 are rejected as depending from an indefinite claim (Claim 22); and Claims 40, 44, 48, and 52 are rejected as depending from an indefinite claim (Claim 28). Any further rejections of, or indications of the allowability of, Claims 22, 28, 34, 40, 42, 44, 46, 48, 50, 52, and 58 are based on Claims 22 and 28 as they are understood/interpreted by the examiner.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in-
(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

Art Unit: 2825

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

7. Claims 19 is rejected under 35 U.S.C. 102(e) as being anticipated by Moon (5,942,310).

Regarding Claim 19 (formerly Claim 28):

Moon discloses (in Figs. 2A-2E) a semiconductor device comprising:

a substrate 100;

at least one pixel electrode 11 formed over said substrate;

at least one thin film transistor (TFT) formed over said substrate for switching said pixel electrode, said TFT comprising:

a semiconductor layer (1, 2) formed over said substrate having at least source, drain and channel regions (i.e., region "1") and a capacitor forming portion (i.e., region "2");

a first insulating film 5 adjacent to said channel region; and

a gate electrode 3 adjacent to said channel region with said first insulating film 5 interposed therebetween (Fig. 2B);

a storage capacitor electrically connected to said TFT, said storage capacitor comprising:

said capacitor forming portion 2 of the semiconductor layer (1, 2);

a capacitor forming electrode 4 adjacent to said capacitor forming portion; and

a second insulating film 6 interposed between said capacitor forming portion and said capacitor forming electrode, wherein said first insulating film 5 is thicker than said second insulating film 6. Therefore, Claim 19 is anticipated.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 18, 30, and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moon (5,942,310) in view of Tanabe et al., hereinafter, "Tanabe"(5,998,838).

Regarding Claim 18 (formerly Claim 27):

Moon discloses (in Figs. 2A-2E) a semiconductor device comprising:

a substrate 100;

at least one pixel electrode 11 formed over said substrate;

at least one thin film transistor (TFT) formed over said substrate for switching said pixel electrode, said TFT comprising:

a semiconductor layer (1, 2) formed over said substrate having at least source, drain and channel regions (i.e., region "1") and a capacitor forming portion (i.e., region "2");

a first insulating film 5 adjacent to said channel region; and

a gate electrode 3 adjacent to said channel region with said first insulating film 5 interposed therebetween (Fig. 2B);

a storage capacitor electrically connected to said TFT, said storage capacitor comprising:

said capacitor forming portion 2 of the semiconductor layer (1, 2);

a capacitor forming electrode 4 adjacent to said capacitor forming portion; and

a second insulating film 6 interposed between said capacitor forming portion and said capacitor forming electrode, wherein said first insulating film 5 is thicker than said second insulating film 6.

Moon **lacks** the capacitor forming electrode 4 being formed of the same conductive layer as the gate electrode 3. However, note Moon discloses (in Figs. 1A-1E) it was very well known in the art to form a capacitor electrode 4 and a gate electrode 3 from the same conductive layer (note Fig. 1C). Tanabe is **cited primarily** to show a TFT having a gate insulating film comprising first and second insulating films (5, 6, e.g., note Figs. 1b and 1c), wherein the first insulating film 5 is formed in an island shape only in the TFT region and the second insulating film 6 is formed such that it covers the TFT region and beyond. Note Tanabe discloses the gate electrode 7 is formed after the second insulating film 6 is formed, i.e., it is important to realize that Moon specifically utilizes the patterned gate electrode 3 as mask in order to pattern the gate insulating layer 5 (note Moon, Fig. 2B and col. 4, lines 58-59), followed by depositing the second insulating film 6 over gate electrode 3 and gate insulating layer 5. Given Tanabe, one of ordinary skill in the art would realize that the insulating layer 5 (of Moon) need not be patterned by pre-forming a gate electrode 3 (note Fig. 2B of Moon), i.e., one of ordinary skill would have readily recognized that the insulating layer 5 (of Moon) could be formed in an island shape (as taught by Tanabe) followed by forming the insulating layer 6 (of Moon) directly over layer 5 and the substrate, prior to forming the gate electrode 3. Therefore, it would have been an obvious matter of design choice for one of ordinary skill in the art to modify Moon by specifying that the capacitor-forming electrode 4 is formed of the same conductive layer as the gate electrode 3 because such a modification would only require that the insulating layer 6 be formed before

Art Unit: 2825

forming the gate electrode 3, i.e., such a modification would only require one to realize that the gate insulating layer 5 (of Moon) need not be formed by utilizing a pre-formed gate electrode; and given Tanabe, one of ordinary skill in the art would have realized that the gate electrode 3 (of Moon) can be formed after forming the insulating layer 6 (note Figs. 2B-2C of Moon) such that the gate electrode and the capacitor electrode can be formed of the same conductive material, as in prior art devices (note Moon, Figs. 1A-1C).

Regarding Claim 30 (formerly Claim 39):

Moon (in view of Tanabe) discloses the claimed invention except for the specific ranges in thickness for the first and second insulating films. However, note that Moon does not specify any particular range in thickness for either the first or second insulating layer, therefore, one of ordinary skill in the art would have incorporated thickness ranges according to design needs. It would have been obvious to one of ordinary skill in the art to specify thickness ranges as currently claimed, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding Claim 54 (formerly Claim 63):

It would have been obvious to one of ordinary skill in the art to incorporate the semiconductor device of Moon (in view of Tanabe) into an electronic device selected from the list recited in the instant claim because it was common in the art to incorporate a LCD device (similar to that disclosed Moon in view of Tanabe) into such electronic devices.

10. Claims 21, 22, 33, 34, 42, 46, 50, 57, and 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moon (5,942,310) in view of Sato (5,818,552).

Regarding Claim 21 (formerly Claim 30):

Moon discloses (in Figs. 2A-2E) a semiconductor device comprising:

a substrate 100;

a semiconductor layer (1, 2) formed over said substrate, said semiconductor layer having at least a pair of impurity regions and a channel region extending therebetween and a capacitor forming portion 2 (NOTE: active semiconductor region “1” will include a pair of impurity regions and a channel region therebetween);

a first insulating film 5 formed on said channel region;

a second insulating film 6 formed on said capacitor forming portion 2 of the semiconductor layer;

a capacitor forming electrode 4 formed over said capacitor forming portion 2 with said second insulating film 6 form a storage capacitor, wherein said first insulating film 5 is thicker than said second insulating film 6;

a third insulating film 7 formed over said storage capacitor and said gate electrode;

an electrode (8, 9) formed on said third insulating film 7;

a “fifth” insulating film formed over said third insulating film; and

a pixel electrode formed on said fifth insulating film and electrically connected to one of said pair of impurity regions.

Moon **lacks** a fourth insulating layer and a black mask formed on the fourth insulating layer; however, it is important to note that Moon does not disclose a complete device. Sato

Art Unit: 2825

discloses it was very well known in the art to incorporate a black matrix (i.e., a black mask) into an active matrix liquid crystal display device (AMLCD), i.e., into a device similar to that disclosed by Moon. Sato discloses it was well known in the art to locate a black mask on a counter substrate or on a driving substrate (note col. 1, lines 56-66). Sato **teaches** (in figure 1A) a device having a black mask (16M, 16P) on a driving substrate, wherein incorporating the black mask requires the following: an insulating layer 17 formed over a previously formed insulating layer 15 and over electrodes 11, 12; the black mask (16M, 16P) being formed on insulating layer 17; another insulating layer 18 formed over the black mask and the insulating layer “17”; and a pixel electrode 6 formed on the insulating layer “18”. Note Sato discloses alignment precision between a pixel electrode and a black mask can be realized by incorporating the black mask into the driving substrate (note col. 1, lines 62-64). It would have been obvious to one of ordinary skill in the art to modify Moon by incorporating a black mask (as taught by Sato) because Sato teaches it was well known in the art to utilize a black mask in a LCD device, wherein locating the black mask on a driving substrate allows precise alignment between a pixel electrode and the black mask. Furthermore, modifying Moon as taught by Sato would require a fourth insulating film and a black mask to be incorporated in a manner as instantly claimed.

Regarding Claim 22 (formerly Claim 31):

Moon discloses (in Figs. 2A-2E) a semiconductor device comprising:

a substrate 100;

at least one pixel electrode 11 formed over said substrate;

at least one TFT formed over said substrate for switching said pixel electrode, said TFT comprising:

Art Unit: 2825

a semiconductor layer (1, 2) having at least source, drain, and channel regions and a capacitor forming portion;

a first insulating film 5 formed on said channel region; and

a gate electrode 3 formed over said channel region with said first insulating film 5 interposed therebetween;

a storage capacitor electrically connected to said TFT, said storage capacitor comprising:

said capacitor forming portion 2 of the semiconductor layer (1, 2);

a capacitor forming electrode 4 formed over said capacitor forming portion; and

a second insulating film 6 interposed between said capacitor forming portion and said capacitor forming electrode, wherein said second insulating film 6 is thicker than **said first insulating film 5**.

Moon **lacks** a light shielding conductive layer formed over said substrate, wherein at least said channel region is overlapped with said light shielding conductive layer. Sato **teaches** incorporating a light shielding conductive layer (i.e., a black matrix) on a driving substrate facilitates precision alignment between a pixel electrode and a black mask (note col. 1, lines 62-64). Note Sato discloses (in Figs. 1A and 3A) a light shielding conductive layer (16M or 16) overlaps at least the channel region of a TFT. It would have been obvious to one of ordinary skill in the art to modify Moon by incorporating a light-shielding conductive layer (as taught by Sato) because Sato teaches it was well known in the art to utilize such a layer in a LCD device, wherein locating the light-shielding layer on a driving substrate allows precise alignment between a pixel electrode and the black mask; furthermore, locating the light-shielding layer on

the driving substrate would result in at least the channel region of the TFT being overlapped by the light-shielding layer.

Regarding Claims 33 and 34 (formerly Claims 42 and 43, respectively):

Moon (in view of Sato) discloses the claimed invention except for the specific ranges in thickness for the first and second insulating films. However, note that Moon does not specify any particular range in thickness for either the first or second insulating layer, therefore, one of ordinary skill in the art would have incorporated thickness ranges according to design needs. It would have been obvious to one of ordinary skill in the art to specify thickness ranges as currently claimed, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding Claims 42, 46, and 50 (formerly Claims 51, 55, and 59, respectively):

Sato discloses (in Fig. 2A) the light shielding conductive layer (16F, 16M) comprises tungsten, tantalum, molybdenum, titanium, etc. (note col. 4, lines 20-22), wherein the conductive layer “16F” is floating and the conductive layer “16M” is electrically connected to a fixed potential (note col. 7, lines 63-66).

Regarding Claims 57 and 58 (formerly Claims 66 and 67, respectively):

It would have been obvious to one of ordinary skill in the art to incorporate the semiconductor device of Moon (in view of Sato) into an electronic device selected from the list recited in the instant claims because it was common in the art to incorporate a LCD device (similar to that disclosed Moon in view of Sato) into such electronic devices.

11. Claims 20, 32, and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moon (5,942,310) in view of Tanabe (5,998,838) and Sato (5,818,552).

Regarding Claim 20 (formerly Claim 29):

This claim is essentially a combination of Claim 18 (*formerly Claim 27*) and Claim 21 (*formerly Claim 30*), i.e., all limitations of Claim 20 can be found in Claims 18 and 21 – Note that Claims 18 and 21 have been addressed in detail (above). In general, Moon discloses all limitations of the instant claim **except** for the following limitations: the capacitor-forming electrode 4 being formed of the same conductive layer as the gate electrode 3; and a fourth insulating layer and a black mask formed on the fourth insulating layer. Sato **teaches** the benefits of incorporating a black mask on the driving substrate (i.e., precision alignment between a black mask and a pixel electrode can be achieved, see above “*Regarding Claim 21*”. Tanabe **teaches** TFTs can have a multi-layered gate insulating film; and given Tanabe, one of ordinary skill in the art would have realized that Moon could be easily modified such that the gate electrode 3 and the capacitor electrode 4 (see Moon, Figs. 2A-2C) are formed of the same conductive layer, wherein performing the “easy modification” would be an obvious matter of design choice, since it was very well known in the art that gate electrodes and capacitor electrodes are commonly formed of the same conductive layer (note Moon, Figs. 1A-1C).

Regarding Claim 32 (formerly Claim 41):

Moon (in view of Tanabe and Sato) discloses the claimed invention except for the specific ranges in thickness for the first and second insulating films. However, note that Moon does not specify any particular range in thickness for either the first or second insulating layer, therefore, one of ordinary skill in the art would have incorporated thickness ranges according to

design needs. It would have been obvious to one of ordinary skill in the art to specify thickness ranges as currently claimed, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding Claim 56 (formerly Claim 65):

It would have been obvious to one of ordinary skill in the art to incorporate the semiconductor device of Moon (in view of Tanabe and Sato) into an electronic device selected from the list recited in the instant claim because it was common in the art to incorporate a LCD device (similar to that disclosed Moon in view of Tanabe and Sato) into such electronic devices.

12. Claims 23, 35, 43, 47, 51, and 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moon (5,942,310) in view of Sato (5,818,552) and Ishizu et al., hereinafter, "Ishizu" (4,984,033).

Regarding Claim 23 (formerly Claim 32):

Initially, this claim is similar to Claim 21 (*formerly Claim 30*) except for the following limitations: (1) a light shielding conductive layer over the substrate; and (2) a first insulating layer formed on said light shielding conductive layer, wherein at least the channel region (of the TFT) is overlapped with said light shielding conductive layer. It is noted that Claim 21 has been addressed in detail above (see above, "*Regarding Claim 21 (formerly Claim 30)*"), wherein Moon in view of Sato renders obvious all limitations of Claim 21; therefore, only the limitations in items "(1)" and "(2)" will be specifically addressed in regards to Claim 23. The combination of Moon and Sato **lacks** items "(1)" and "(2)" because neither reference specifically discloses a

light shielding conductive layer located “under” the semiconductor layer. Ishizu teaches (in Fig. 3) it was very well known in the art to incorporate a light shielding conductive layer 2 and an insulating layer 3 into a device utilizing TFTs, wherein the light-shielding layer 2 is located “under” the semiconductor/active layer (4, 6). Note in col. 1 (lines 43-55), Ishizu discloses the light-shielding layer eliminates problems associated with incident light from the outside. In summary, Moon discloses the general inventive aspect of a device comprising a TFT and a capacitor structure, wherein the TFT has an insulating film that is thicker than the insulating film of the capacitor structure; Sato and Ishizu teach it was very well known in the art to utilize light shielding layers; Sato teaches alignment precision between a pixel electrode and a black mask can be achieved by forming the black mask on the driving substrate; Ishizu teaches that problems associated with incident light from the outside can be prevented by utilizing a light-shielding layer “under” the semiconductor/active layer; therefore, it would have been obvious to one of ordinary skill in the art to modify Moon by incorporating a black mask (as taught by Sato) and a light-shielding layer (as taught by Ishizu) because black masks and light-shielding layers were commonly incorporated into a device similar to that disclosed by Moon (note that Moon is not concerned with disclosing all feature of a completed device), furthermore, modifying Moon as taught by Sato and Ishizu could significantly improve device performance because precision alignment between a black mask and a pixel electrode can be achieved and incident light from the outside can be effectively blocked.

Regarding Claim 35 (formerly Claim 44):

Moon (in view of Sato and Ishizu) discloses the claimed invention except for the specific ranges in thickness for the first and second insulating films. However, note that Moon does not

Art Unit: 2825

specify any particular range in thickness for either the first or second insulating layer, therefore, one of ordinary skill in the art would have incorporated thickness ranges according to design needs. It would have been obvious to one of ordinary skill in the art to specify thickness ranges as currently claimed, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding Claims 43, 47, and 51 (formerly Claims 52, 56, and 60, respectively):

Sato discloses (in Fig. 2A) the light shielding conductive layer (16F, 16M) comprises tungsten, tantalum, molybdenum, titanium, etc. (note col. 4, lines 20-22), wherein the conductive layer “16F” is floating and the conductive layer “16M” is electrically connected to a fixed potential (note col. 7, lines 63-66).

Regarding Claim 59 (formerly Claim 68):

It would have been obvious to one of ordinary skill in the art to incorporate the semiconductor device of Moon (in view of Sato and Ishizu) into an electronic device selected from the list recited in the instant claim because it was common in the art to incorporate a LCD device (similar to that disclosed Moon in view of Tanabe) into such electronic devices.

13. Claims 24 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moon (5,942,310) in view of Tanabe (5,998,838) and Misawa et al., hereinafter, “Misawa” (5,341,012).

Regarding Claim 24 (formerly Claim 33):

This claim is essentially the same as Claim 18 (*formerly Claim 27*) with the exception being that the instant claim is drawn to a projector having the additional limitations of a light

source. It is noted that Moon (in view of Tanabe) discloses all limitations of the liquid crystal panel (see above *Regarding Claim 18*). Misawa is **cited only** to show it was very well known in the art that a projector would include a light source in combination with an active matrix panel (i.e., a liquid crystal panel, note Fig. 18 and col. 16, lines 11-45). It would have been obvious to one of ordinary skill in the art to incorporate the semiconductor device of Moon (in view of Tanabe) into a projector having a light source because Misawa shows it was very well known in the art to make such an incorporation.

Regarding Claim 36 (formerly Claim 45):

Moon (in view of Tanabe and Misawa) discloses the claimed invention except for the specific ranges in thickness for the first and second insulating films. However, note that Moon does not specify any particular range in thickness for either the first or second insulating layer, therefore, one of ordinary skill in the art would have incorporated thickness ranges according to design needs. It would have been obvious to one of ordinary skill in the art to specify thickness ranges as currently claimed, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

14. Claims 25 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moon (5,942,310) in view of Misawa (5,341,012).

Regarding Claim 25 (formerly Claim 34):

This claim is essentially the same as Claim 19 (*formerly Claim 28*) with the exception being that the instant claim is drawn to a projector having the additional limitations of a light

source. It is noted that Moon discloses all limitations of the liquid crystal panel (see above *Regarding Claim 19*). Misawa is **cited only** to show it was very well known in the art that a projector would include a light source in combination with an active matrix panel (i.e., a liquid crystal panel, note Fig. 18 and col. 16, lines 11-45). It would have been obvious to one of ordinary skill in the art to incorporate the semiconductor device of Moon into a projector having a light source because Misawa shows it was very well known in the art to make such an incorporation.

Regarding Claim 37 (formerly Claim 46):

Moon (in view of Misawa) discloses the claimed invention except for the specific ranges in thickness for the first and second insulating films. However, note that Moon does not specify any particular range in thickness for either the first or second insulating layer, therefore, one of ordinary skill in the art would have incorporated thickness ranges according to design needs. It would have been obvious to one of ordinary skill in the art to specify thickness ranges as currently claimed, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

15. Claims 26 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moon (5,942,310) in view of Tanabe (5,998,838), Sato (5,818,552), and Misawa (5,341,012).

Regarding Claim 26 (formerly Claim 35):

This claim is essentially the same as Claim 20 (*formerly Claim 29*) with the exception being that the instant claim is drawn to a projector having the additional limitations of a light

source. It is noted that Moon (in view of Tanabe and Sato) discloses all limitations of the liquid crystal panel (see above *Regarding Claim 20*). Misawa is **cited only** to show it was very well known in the art that a projector would include a light source in combination with an active matrix panel (i.e., a liquid crystal panel, note Fig. 18 and col. 16, lines 11-45). It would have been obvious to one of ordinary skill in the art to incorporate the semiconductor device of Moon (in view of Tanabe and Sato) into a projector having a light source because Misawa shows it was very well known in the art to make such an incorporation.

Regarding Claim 38 (formerly Claim 47):

Moon (in view of Tanabe, Sato, and Misawa) discloses the claimed invention except for the specific ranges in thickness for the first and second insulating films. However, note that Moon does not specify any particular range in thickness for either the first or second insulating layer, therefore, one of ordinary skill in the art would have incorporated thickness ranges according to design needs. It would have been obvious to one of ordinary skill in the art to specify thickness ranges as currently claimed, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

16. Claims 27, 28, 39, 40, 44, 48, and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moon (5,942,310) in view of Sato (5,818,552) and Misawa (5,341,012).

Regarding Claims 27 and 28 (formerly Claims 36 and 37, respectively):

These claims are essentially the same as Claims 21 and 22 (*formerly Claims 30 and 31, respectively*) with the exception being that the instant claim is drawn to a projector having the

Art Unit: 2825

additional limitations of a light source. It is noted that Moon (in view of Sato) discloses all limitations of the liquid crystal panel (see above *Regarding Claim 21 and Regarding Claim 22*). Misawa is **cited only** to show it was very well known in the art that a projector would include a light source in combination with an active matrix panel (i.e., a liquid crystal panel, note Fig. 18 and col. 16, lines 11-45). It would have been obvious to one of ordinary skill in the art to incorporate the semiconductor device of Moon (in view of Sato) into a projector having a light source because Misawa shows it was very well known in the art to make such an incorporation.

Regarding Claims 39 and 40 (formerly Claims 48 and 49, respectively):

Moon (in view of Sato and Misawa) discloses the claimed invention except for the specific ranges in thickness for the first and second insulating films. However, note that Moon does not specify any particular range in thickness for either the first or second insulating layer, therefore, one of ordinary skill in the art would have incorporated thickness ranges according to design needs. It would have been obvious to one of ordinary skill in the art to specify thickness ranges as currently claimed, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding Claims 44, 48, and 52 (formerly Claims 53, 57, and 61, respectively):

Sato discloses (in Fig. 2A) the light shielding conductive layer (16F, 16M) comprises tungsten, tantalum, molybdenum, titanium, etc. (note col. 4, lines 20-22), wherein the conductive layer “16F” is floating and the conductive layer “16M” is electrically connected to a fixed potential (note col. 7, lines 63-66).

Art Unit: 2825

17. Claims 29, 41, 45, 49, and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moon (5,942,310) in view of Sato (5,818,552), Ishizu (4,984,033), and Misawa (5,341,012).

Regarding Claim 29 (formerly Claim 38):

This claim is essentially the same as Claim 23 (*formerly Claims 32*) with the exception being that the instant claim is drawn to a projector having the additional limitations of a light source. It is noted that Moon (in view of Sato and Ishizu) discloses all limitations of the liquid crystal panel (see above *Regarding Claim 23*). Misawa is **cited only** to show it was very well known in the art that a projector would include a light source in combination with an active matrix panel (i.e., a liquid crystal panel, note Fig. 18 and col. 16, lines 11-45). It would have been obvious to one of ordinary skill in the art to incorporate the semiconductor device of Moon (in view of Sato and Ishizu) into a projector having a light source because Misawa shows it was very well known in the art to make such an incorporation.

Regarding Claims 41 (formerly Claim 50):

Moon (in view of Sato, Ishizu, and Misawa) discloses the claimed invention except for the specific ranges in thickness for the first and second insulating films. However, note that Moon does not specify any particular range in thickness for either the first or second insulating layer, therefore, one of ordinary skill in the art would have incorporated thickness ranges according to design needs. It would have been obvious to one of ordinary skill in the art to specify thickness ranges as currently claimed, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding Claims 45, 49, and 53 (formerly Claims 54, 58, and 62, respectively):

Sato discloses (in Fig. 2A) the light shielding conductive layer (16F, 16M) comprises tungsten, tantalum, molybdenum, titanium, etc. (note col. 4, lines 20-22), wherein the conductive layer “16F” is floating and the conductive layer “16M” is electrically connected to a fixed potential (note col. 7, lines 63-66).

18. Claims 31 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moon (5,942,310).

Regarding Claim 31 (formerly Claim 40):

Moon anticipates the device of Claim 19 (*formerly Claim 28*), i.e., Moon discloses the claimed invention except for the specific ranges in thickness for the first and second insulating films. However, note that Moon does not specify any particular range in thickness for either the first or second insulating layer, therefore, one of ordinary skill in the art would have incorporated thickness ranges according to design needs. It would have been obvious to one of ordinary skill in the art to specify thickness ranges as currently claimed, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding Claim 55 (formerly Claim 64):

It would have been obvious to one of ordinary skill in the art to incorporate the semiconductor device of Moon into an electronic device selected from the list recited in the instant claim because it was common in the art to incorporate a LCD device (similar to that disclosed Moon) into such electronic devices.

Art Unit: 2825

Conclusion

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The references listed on the attached "Notice of References Cited" are cited to show devices having different insulating layers, LCD devices having features similar to those of the current invention, light-shielding layers "under" a semiconductor layer, etc.

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lex Malsawma whose telephone number is 703-306-5986.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on 703-308-1323. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Lex Malsawma



February 8, 2003



MATTHEW SMITH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800